

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	EL	TB	0001	D01	

طرح نگهداشت و افزایش تولید ۲۷ مخزن

TBE FOR TRANSFORMERS

نگهداشت و افزایش تولید میدان نفتی بینک

D01	Sep. 2024	IFI	H.Shakiba	M.Fakharian	M.Sadeghian	
D00	Nov. 2023	IFI	H.Shakiba	M.Fakharian	S.Faramarzpour	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	Client Approval

Class:3

Client Doc. Number: F0Z-709328

Status:

IDC: Inter-Discipline Check
 IFC: Issued For Comment
 IFA: Issued For Approval
 AFD: Approved For Design
 AFC: Approved For Construction
 AFP: Approved For Purchase
 AFQ: Approved For Quotation
 IFI: Issued For Information
 AB-R: As-Built for Client Review
 AB-A: As-Built –Approved

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							
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شماره صفحه ۳: از ۲۴

TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
1. General								
1.1	Manufacturer's Name	By Vendor	Iran Transfo	A	Kian Transfo	A	Arya Transfo Co	A
1.2	Transformer Tag Number	GCS-TR-001 & GCS-TR-002	Ok	A	Ok	A	Ok	A
1.3	Quantity	2	Ok	A	Ok	A	Ok	A
1.4	Standard	IPS-M-EL-152 (3) BK-GNRL-PEDCO-000-EL-SP-0004	Ok	A	Ok	A	Ok	A
1.5	Kind/Construction of Transformer	Oil Immersed, Hermetically Sealed With Pillow Nitrogen, Separate High & Low Windings, Two Winding	Ok	A	Hermetic Gas Cushion	A	Ok	A
1.6	Rated Power in Service Condition	1250 kVA	1250 KVA	A	Ok	A	Ok	A
1.7	Supply Frequency	50 Hz $\pm$ 5 %	Ok	A	Ok	A	Ok	A
1.8	Winding Connection/Vector Group	Dyn11	Dyn11	A	Ok	A	Ok	A
1.9	Location	Outdoor Under Shelter, Safe Area	Ok	A	Ok	A	Ok	A
1.10	Primary Winding Rated Voltage	11kV	11kV	A	Ok	A	Ok	A
1.11	Secondary Winding Rated Voltage	0.42 KV	0.42 KV	A	Ok	A	Ok	A
1.12	Tapping Range	$\pm$ 5%, $\pm$ 2.5% & 0 , Off Load	Ok	A	Ok	A	Ok	A
1.13	Tapping Place	On HV Winding	On HV Side	A	Ok	A	Ok	A



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شماره صفحه ۴ : از ۲۴

TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
2. Environmental Conditions (Process Basis Of Design, BK-GNRAL-PEDCO-000-PR-DB-0001)								
2.1	Ambient Temperature Range	0 ~ 52°C	0 ~ 55°C	A	Ok	A	55°C	A
2.2	Installation Elevation	12m (Above Sea Level)	Ok	A	Ok	A	Ok	A
2.3	Area Pollution Class	Class 4 (Very High)	Ok	A	Ok	A	31 mm/Kv CD	A
2.4	Seismic Loads	Zone 3 UBC	Ok	A	Ok	A	Ok	A
2.5	Relative Humidity	100%	Ok	A	Ok	A	Ok	A
2.6	Cooling System	ONAN	ONAN	A	Ok	A	Ok	A
2.7	Primary Cooling Media	Mineral Oil	Mineral Oil	A	Ok	A	Ok	A
3. Primary Winding Voltage Rating								
3.1	Highest System Voltage	12kV	12kV	A	Ok	A	Ok	A
3.2	Rated Lightning Impulse Withstand Voltage	75kV	75kV	A	Ok	A	Ok	A
3.3	Rated Short Duration Power Frequency Withstand Voltage(rms)	28kV	28kV	A	Ok	A	Ok	A
4. Secondary Winding Voltage Ratings								
4.1	Highest System Voltage	1 kV	1.1	A	Ok	A	Ok	A
4.2	Rated Lightning Impulse Withstand Voltage	3 kV	N.A	A	Ok	A	N.A Acc to IEC	A



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
4.3	Rated Short Duration Power Frequency Withstand Voltage(rms)	1 kV	3 Kv	A	Ok	A	3 Kv	A
4.4	Primary Winding	Delta Winding	Delta	A	Ok	A	Ok	A
4.5	Secondary Winding	Star, (Solidly Grounded)	Ok	A	Ok	A	Ok	A
4.6	Insulation Type	By Vendor	PSP & Paper	A	Uniform	A	Uniform	A
4.7	Insulation Class	Class A (Shall Be Suggested By Vendor)	Class A	A	Class A	A	Ok	A
4.8	Average Winding Temperature Rise (55°C Ambient)	65°C, Acc. to IEC 60076-2, Clause 4.2	50°C	A	50°C	A	50°C over 55°C ambient	A
4.9	Top Oil Temperature Rise (55°C ambient)	60°C, Acc. to IEC 60076-2, Clause 4.2	45°C	A	45°C	A	45°C over 55°C ambient	A
4.10	Oil Preservation System	Not Applicable (Sealed Type)	N.A	A	N.A	A	N.A	A
4.11	Short Circuit Level of HV System	Primary: 25 kA	Ok for Network	A	Ok	A	Confirmed for Network Study	A
4.12	Short Circuit Withstand Duration	Primary: 1 S	1s	A	Ok	A	Ok	A
4.13	Required Short Circuit Impedance @75°C	5%	5%	A	5%	A	Ok	A
4.14	Zero Sequence Impedance	By Vendor	~5%	A	4.46	A	~4%	A
4.15	X/R Ratio at Principal Tap	By Vendor	3.91	A	4.59	A	~3.6%	A
4.16	Efficiency at Full Load & PF=0.8 Lag (100% Load)	By Vendor	98.32	A	98.94	A	98.15	A



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Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
4.17	Efficiency at Full Load & PF=0.8 Lag (75% Load)	By Vendor	98.66	A	99.15	A	98.51	A
4.18	Efficiency at Full Load & PF=0.8 Lag (50% Load)	By Vendor	98.94	A	99.3	A	98.8	A
5. Primary Winding Characteristics								
5.1	Reactance [Ω]	By Vendor	-	A	After Test	A	~7	A
5.2	Resistance [Ω] @ 75°C	By Vendor.	1.529	A	After Test	A	~2	A
6. Secondary Winding Characteristics								
6.1	Reactance [Ω]	By Vendor	-	A	After Test	A	~0.002	A
6.2	Resistance [Ω] @ 75°C	By Vendor	0.00056	A	After Test	A	~0.0006	A
7. Tolerances								
7.1	Voltage Ratio at Principal Tap & No-Load	$\pm 0.5 \%$	$\pm 0.5 \%$	A	$\pm 0.5 \%$	A	Ok	A
7.2	Voltage Ratio at Other Tapping	$\pm 0.5 \%$	$\pm 0.5 \%$	A	$\pm 0.5 \%$	A	Ok	A
7.3	Voltage	$\pm 10 \%$	$\pm 10 \%$	A	$\pm 10 \%$	A	Ok	A
7.4	Frequency	$\pm 5 \%$	$\pm 5 \%$	A	$\pm 5 \%$	A	Ok	A
7.5	Short Circuit Impedance at Principal Tap	$\pm 10\%$ of Declared Value	Ok	A	$\pm 10\%$ of Declared Value	A	Ok	A



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TBE for 1250 KVA Power Transformers								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
7.6	Short Circuit Impedance at Other Tapping	±15% of Declared Value	Ok	A	±15% of Declared Value	A	Ok	A
7.7	Anticipated Unbalance Loading in Percent of Rated Power	10 %	Ok	A	10 %	A	Ok	A
7.8	Core Construction	Laminated Silicon Steel	Ok	A	Laminated Silicon Steel	A	Ok	A
7.9	Flux Density in the Magnetic Circuit @Nominal Frequency & Voltage	By Vendor	1.67 T	A	1.68 T	A	~1.7	A
7.10	No-Load Loss [W]	By Vendor	2000	A	1730	A	1800	A
7.11	Full Load Total Loss [W]	By Vendor	16000	A	14930	A	17000	A
7.12	Inrush Current	By Vendor	602 A	A	0.65 KA	A	HV: ~0.5 KA foe 0.6 sec	A
7.13	Short Circuit Loss	By Vendor	16000	A	13200	A	17000	A
7.14	I2R Loss at Rated Current & Principal Tap	By Vendor	14000	A	11600	A	15500	A
7.15	Stray Load Loss at Rated Current & Principal Tap	By Vendor	2000	A	1600	A	1500	A
7.16	11 kV Cables Size & Number	1x3x95 CU/SM/XLPE/SM/SC/PVC/SWA/PVC	By Customer	A	Acc to Request	A	Ok	A
7.17	External Terminations, Primary Side (Exposed Bushings/Cable Box)	Cable Box	Cable Box	A	Cable Box	A	Ok	A
7.18	0.42 kV Cable Size & Number	14x(1x300) CU/XLPE/Bd/AWA/PVC	By Customer	A	Acc to Request	A	Ok	A



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
7.19	Type & Size of Cable Glands (Power Cable)	Industrial, Primary: M90 Secondary: M40	By Customer	A	Acc to Request	A	Cable gland is out of vendor scope	A
7.20	Type & Size of Cable Glands (Control Cable)	12x2.5, CU/PVC/SWA/PVC, M25	By Customer	A	Acc to Request	A	Acc to Arya Transfo Standard	A
7.21	Bushing Type	Acc .to IPS 152	DT 20Nf 250	A	Acc .to IPS 152	A	Ok	A
7.22	Dimension (W X D X H) [mm]	By Vendor	2606 x 2153 x 2477	A	2120 x 1350 x 1980	A	2900 x 2400 x 2250	A
7.23	Weight [kg]	By Vendor	5413	A	4050	A	5175	A
7.24	Weight of Transformer Without Oil	By Vendor	4154	A	2710	A	4130	A
7.25	Noise Level (at 1m From Transformer) [db]	Less Than 85 dB(A)	Ok	A	70	A	Ok	A
7.26	Oil Volume [liter]	By Vendor	1407	A	1450	A	1200	A
7.27	Oil Weight [kg]	By Vendor	1259	A	1380	A	1045	A
7.28	Oil Characteristics (Name/ Type/ Flash Point)	Acc. to IEC 60296	IEC 60296	A	Acc. to IEC 60296	A	Mineral/140c	A
8.Auxiliary Equipment								
8.1	Top Oil Thermometer (in Thermometer Pocket)	Required (Can Be Measured at Low Oil Level)	Ok	A	Ok	A	Ok	A
8.2	Thermostat for Oil Temperature	Dial Type / with Alarm & Trip Switches	Ok	A	Ok	A	Ok	A



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Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.3	Oil Level Gauge	Magnetic Dial or Glass Type	Magnetic Dial	A	Magnetic Dial	A	Ok	A
8.4	Oil Filling Plug, Drain Valve, Isolating Valve	Required	Ok	A	Ok	A	Ok	A
8.5	Oil Level Indicator With Contacts (Low & High)	Required (Magnetic Type)	Ok	A	Magnetic Type	A	Ok	A
8.6	Winding Temperature Indicator with Alarm & Trip Contacts	Required (Shall be Located Close to Low Voltage Windings)	Ok (LV Side Phase 2V)	A	Ok	A	Ok	A
8.7	Oil Drain / Sampling Device	Required	Ok	A	Ok	A	Ok	A
8.8	Air Dehydrating Breathed	Not Required	N.A	A	NA	A	Ok	A
8.9	Neutral Current Transformer	Core 1: 2000/1A, 5P10 ,10VA	2000/1A, 5P10, 10VA	A	2000/1A, 5P10, 10VA	A	Ok	A
8.10	CT to be Supplied by (Transformer Manufacturer/Purchaser)	Transformer Manufacturer	Ok	A	PEJVAK	A	Ok	A
8.11	Earth Terminal	Two Terminals on The Bottom of Tank	Ok	A	Ok	A	Ok	A
8.12	Upper Filter Connection With Standard Seal Valve & a Plug Serving	Required	Ok	A	Ok	A	Ok	A
8.13	Pressure Relief Valve with Contact (Shall be Operated by Internal Pressure of Nitrogen)	Required	Ok	A	Ok	A	Pressure relief with trip for oil pressure	A
8.14	Gas Pressure & Vacuum Indicator for Internal Pressure of Nitrogen Gas	Required	Ok	A	Ok	A	Ok	A



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Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.15	Terminal Box With Gland Plate	Required	Ok	A	Ok	A	Ok	A
8.16	Instrument and CT Secondary Terminal Box	Required (Min IP55)	IP 55	A	Ok	A	Ok	A
8.17	Arching Horn	Not Required	N.A	A	NA	A	Ok	A
8.18	Drain Valve	Required	Ok	A	Ok	A	Ok	A
8.19	Lifting and Pulling Eyes	Required	Ok	A	Ok	A	Ok	A
8.20	Lugs	Fixed to Tanks for Lifting the Complete Transformer	Ok	A	Ok	A	Ok	A
8.21	HV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	Ok	A	Ok	A
8.22	LV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	Ok	A	Ok	A
8.23	Wheels, Bidirectional (Turnable by 90°)	Required	Ok	A	Ok	A	Ok	A
8.24	Transformer Radiator	By Vendor (Welded/Bolted)	Bolted	A	Welded	A	Bolted	A
8.25	Transformer Cover	To be Welded to Tank With a Continuous Weld	Bolted	N	Ok	A	Cover will be bolted	N
8.26	Thickness of Radiator Plate	By Vendor	1.2 mm	A	1.25 mm	A	1.2 mm	A
8.27	Thickness of Tank Wall, Base & Cover	By Vendor	8, 8, 8 mm	A	8 mm	A	6, 8, 6 mm	A
8.28	Tank Painting Specification	By Vendor	Acc to Iran Trasfo Painting Procedure	A	Poly Uthane	A	RAL 7032	A



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.29	Radiator Painting Specification	By Vendor	Acc to Iran Trasfo Painting Procedure	A	Poly Uthane	A	RAL 7032	A
8.30	Tank and Radiator Color	By Vendor	RAL 7032	A	7032	A	RAL 7032	A
8.31	Radiator Connection	Detachable & Shall be Bolted to Tank	Ok	A	Bolted	A	Ok	A
8.32	Rating Plate	Stainless Steel	Ok	A	Stainless Steel	A	Ok	A
8.33	Accessory Equipment Contacts Current / Voltage Rating	5A / 250VAC	Acc to Catalogue	A	5A / 250VAC	A	2A / 230VAC	A
8.34	Accessory Equipment Contacts Type	Dry Type -DPDT/ 230VAC	SPDT	A	Ok	A	Ok	A
8.35	Routine Tests Including	IEC60076	IEC60076	A	IEC60076	A	Ok	A
8.36	a) Measurement of Winding Resistance	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A
8.37	b) Measurement of Voltage Ratio & Check of Voltage Vector Relationship	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A
8.38	c) Measurement of Impedance Voltage (Principal Tapping) Short-Circuit Impedance & Load Loss	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A
8.39	d) Measurement of No-Load Loss & Current	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A
8.40	e) Impedance & Load Losses at Rated Current on Principal Tap	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	TBE FOR TRANSFORMERS								شماره صفحه: ۱۲ از ۲۴
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	EL	TB	0001	D01	

TBE for 1250 KVA Power Transformers								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.41	f) Applied Potential & Induced Potential Tests	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A
8.42	g) Dielectric tests	Witness & Report	Ok	A	Witness & Report	A	Acc to Contract	A
8.43	Type Test	Test Report on the Same Design Transformer is Required	Ok	A	Ok	A	Acc to Contract	A
8.44	Painting & Finish	Manufacture Standard	Ok	A	Manufacture Standard	A	Ok	A
8.45	Test Report on CTs	- turns ratio error - Excitation Characteristics - Secondary resistance - Verification of low leakage flux	-	A	Ok	A	-	A
8.46	Special Tools if Any	By Vendor	-	A	NA	A	NA	A
8.47	Deviation from This Specification if Any	By Vendor	Attached	A	No Deviation	A	Red items	A

Status Legends:

A=Acceptable

N=Not Acceptable

N/A=Not Applicable

INA=Information Not Available

C=Clarification is Required

CA= Conditionally Acceptable

M = Requirement is Mandatory



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شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

TBE FOR TRANSFORMERS

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادر کننده	بسته کاری	پروژه
D01	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه: ۱۳ از ۲۴

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
1. General								
1.1	Manufacturer's Name	By Vendor	Iran Transfo	A	Kian Transfo	A	Arya Transfo Co	A
1.2	Transformer Tag Number	GCS-TR-003 (Fire Water Transformer)	Ok	A	Ok	A	OK	A
1.3	Quantity	1	Ok	A	1	A	OK	A
1.4	Standard	IPS-M-EL-152 (3) BK-GNRL-PEDCO-000-EL-SP-0004	Ok	A	Ok	A	OK	A
1.5	Kind/Construction of Transformer	Oil Immersed, Hermetically Sealed With Pillow Nitrogen Separate High & Low Windings Two Winding	Ok	A	Gas Cushion	A	OK	A
1.6	Rated Power in Service Condition	800 kVA	800 kVA	A	800 kVA	A	OK	A
1.7	Supply Frequency	50 Hz $\pm$ 5 %	Ok	A	50 Hz $\pm$ 5 %	A	OK	A
1.8	Winding Connection/Vector Group	Dyn11	Dyn11	A	Dyn11	A	OK	A
1.9	Location	Outdoor Under Shelter, Safe Area	Outdoor	A	Outdoor	A	OK	A
1.10	Primary Winding Rated Voltage	11kV	11	A	11	A	OK	A
1.11	Secondary Winding Rated Voltage	3.45 KV	3.45	A	3.45	A	3.45	A
1.12	Tapping Range	$\pm$ 5%, $\pm$ 2.5% & 0 , Off Load	Ok	A	Ok	A	OK	A
1.13	Tapping Place	On HV Winding	On HV Side	A	On HV Winding	A	OK	A



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TBE FOR TRANSFORMERS

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D01	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه: ۱۴ از ۲۴

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
2. Environmental Conditions (Process Basis Of Design, BK-GNRAL-PEDCO-000-PR-DB-0001)								
2.1	Ambient Temperature Range	0 ~ 52°C	0 ~ 55°C	A	0 ~ 52°C	A	55°C	A
2.2	Installation Elevation	12m (Above Sea Level)	Ok	A	12m (Above Sea Level)	A	OK	A
2.3	Area Pollution Class	Class 4 (Very High)	Ok	A	Class 4 (Very High)	A	31 mm/Kv CD	A
2.4	Seismic Loads	Zone 3 UBC	Ok	A	Zone 3 UBC	A	OK	A
2.5	Relative Humidity	100%	Ok	A	100%	A	OK	A
2.6	Cooling System	ONAN	ONAN	A	ONAN	A	OK	A
2.7	Primary Cooling Media	Mineral Oil	Mineral Oil	A	Mineral Oil	A	OK	A
3. Primary Winding Voltage Rating								
3.1	Highest System Voltage	12kV	12kV	A	12	A	OK	A
3.2	Rated Lightning Impulse Withstand Voltage	75kV	75kV	A	75	A	OK	A
3.3	Rated Short Duration Power Frequency Withstand Voltage (rms)	28kV	28kV	A	28	A	OK	A



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D01	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه: ۱۵ از ۲۴

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
4. Secondary Winding Voltage Ratings								
4.1	Highest System Voltage	3.6 kV	3.6	A	3.6	A	OK	A
4.2	Rated Lightning Impulse Withstand Voltage	20 kV	40	A	20	A	OK	A
4.3	Rated Short Duration Power Frequency Withstand Voltage(rms)	10 kV	10	A	10	A	OK	A
4.4	Primary Winding	Delta Winding	Delta	A	Delta Winding	A	OK	A
4.5	Secondary Winding	Star, (Neutral Grounding Resistors (NGR))	Ok	A	Star, NGR	A	OK	A
4.6	Insulation Type	By Vendor	PSP & Paper	A	By Vendor	A	Uniform	A
4.7	Insulation Class	Class A (Shall Be Suggested By Vendor)	Class A	A	Class A	A	OK	A
4.8	Average Winding Temperature Rise (55°C Ambient)	65°C, Acc. to IEC 60076-2, Clause 4.2	50°C	A	50°C	A	50°C over 55°C ambient	A
4.9	Top Oil Temperature Rise (55°C ambient)	60°C, Acc. to IEC 60076-2, Clause 4.2	45°C	A	45°C	A	45°C over 55°C ambient	A
4.10	Oil Preservation System	Not Applicable (Sealed Type)	N.A	A	NA	A	N.A	A
4.11	Short Circuit Level of HV System	Primary: 25 kA	Ok for Network	A	Primary: 25 kA	A	Confirmed for Network Study	A
4.12	Short Circuit Withstand Duration	Primary: 1S	1s	A	Primary: 1S	A	OK	A



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D01	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه : ۱۶ از ۲۴

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
4.13	Required Short Circuit Impedance @75°C	5%	5%	A	5%	A	Ok	A
4.14	Zero Sequence Impedance	By Vendor	~5%	A	4.62	A	~ 4%	A
4.15	X/R Ratio at Principal Tap	By Vendor	3.9	A	4.72	A	~3.6 %	A
4.16	Efficiency at Full Load & PF=0.8 lag (100% Load)	By Vendor	98.22	A	98.83	A	98.11	A
4.17	Efficiency at Full Load & PF=0.8 lag (75% Load)	By Vendor	98.58	A	98.91	A	98.46	A
4.18	Efficiency at Full Load & PF=0.8 lag (50% Load)	By Vendor	98.9	A	98.99	A	98.75	A
5. Primary Winding Characteristics								
5.1	Reactance [Ω]	By Vendor	-	A	After Test	A	~12.5	A
5.2	Resistance [Ω] @ 75°C	By Vendor.	3.234	A	After Test	A	~3.4	A
6. Secondary Winding Characteristics								
6.1	Reactance [Ω]	By Vendor	-	A	After Test	A	~0.25	A
6.2	Resistance [Ω] @ 75°C	By Vendor	0.06933	A	After Test	A	~0.07	A
7. Tolerances								
7.1	Voltage Ratio at Principal Tap & No-Load	±0.5 %	±0.5 %	A	±0.5 %	A	Ok	A



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	BK							

TBE for <u>800</u> KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
7.2	Voltage Ratio at Other Tapping	±0.5 %	±0.5 %	A	±0.5 %	A	Ok	A
7.3	Voltage	±10 %	±10 %	A	±10 %	A	Ok	A
7.4	Frequency	±5 %	±5 %	A	±5 %	A	Ok	A
7.5	Short Circuit Impedance at Principal Tap	±10% of Declared Value	Ok	A	±10% of Declared Value	A	Ok	A
7.6	Short Circuit Impedance at Other Tapping	±15% of Declared Value	Ok	A	±15% of Declared Value	A	Ok	A
7.7	Anticipated Unbalance Loading in Percent of Rated Power	10 %	10 %	A	10 %	A	Ok	A
7.8	Core Construction	Laminated Silicon Steel	Ok	A	Laminated Silicon Steel	A	Ok	A
7.9	Flux Density in the Magnetic Circuit @Nominal Frequency & Voltage	By Vendor	1.7 T	A	1.67 T	A	~1.7	A
7.10	No-Load Loss [W]	By Vendor	1100	A	1150	A	1300	A
7.11	Full Load Total Loss [W]	By Vendor	10500	A	9650	A	11000	A
7.12	Inrush Current	By Vendor	377 A	A	0.42 KA	A	HV: ~0.3kA for 0.6sec	A
7.13	Short Circuit Loss	By Vendor	10500	A	8500	A	11000	A
7.14	I²R Loss at Rated Current & Principal Tap	By Vendor	9900	A	7400	A	10200	A



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TBE FOR TRANSFORMERS

پروژه

BK

بسته کاری

GCS

صادرکننده

PEDCO

تسهیلات

120

رشته

EL

نوع مدرک

TB

سریال

0001

نسخه

D01

شماره صفحه: ۱۸ از ۲۴

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
7.15	Stray Load Loss at Rated Current & Principal Tap	By Vendor	600	A	1100	A	800	A
7.16	11 kV Cables Size & Number	1x3x95 CU/SM/XLPE/SM/SC/PVC/SWA/PVC	By Customer	A	Acc to Request	A	Ok	A
7.17	External Terminations, Primary Side (Exposed Bushings/Cable Box)	Cable Box	Cable Box	A	Cable Box	A	Ok	A
7.18	3.45 kV Cable Size & Number	1x3x95 CU/SM/XLPE/SM/SC/PVC/SWA/PVC	By Customer	A	Acc to Request	A	Ok	A
7.19	Type & Size of Cable Glands (Power Cable)	Industrial, Primary: M90 Secondary: M75	By Customer	A	Acc to Request	A	Cable gland is out of vendor scope	A
7.20	Type & Size of Cable Glands (Control Cable)	12x2.5, CU/PVC/SWA/PVC, M25	By Customer	A	Acc to Request	A	Acc. to Arya transfo standard	A
7.21	Bushing Type	Acc .to IPS 152	DT 20Nf 250	A	Ok	A	Ok	A
7.22	Dimension (W X D X H) [mm]	By Vendor	2192 x 1860 x 2055	A	2050 x 1150 x 1890	A	2300 x 2360 x 2100	A
7.23	Weight [kg]	By Vendor	3898	A	2820	A	3860	A
7.24	Weight of Transformer Without Oil [kg]	By Vendor	3098	A	1950	A	3070	A
7.25	Noise Level (at 1m from Transformer) [db]	Less Than 85 dB(A)	Ok	A	65	A	Ok	A
7.26	Oil Volume [liter]	By Vendor	894	A	970	A	900	A
7.27	Oil Weight [kg]	By Vendor	800	A	870	A	790	A



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D01	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه : ۱۹ از ۲۴

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
7.28	Oil Characteristics (Name/ Type/ Flash Point)	Acc. to IEC 60296	IEC 60296	A	IEC 60296	A	Mineral/140c	A
8.Auxiliary Equipment								
8.1	Top Oil Thermometer (in Thermometer Pocket)	Required (Can Be Measured at Low Oil Level)	Ok	A	Ok	A	Ok	A
8.2	Thermostat for Oil Temperature	Dial Type / with Alarm & Trip Switches	Ok	A	Ok	A	Ok	A
8.3	Oil Level Gauge	Magnetic Dial or Glass Type	Magnetic Dial	A	Magnetic Dial	A	Ok	A
8.4	Oil Filling Plug, Drain Valve, Isolating Valve	Required	Ok	A	Ok	A	Ok	A
8.5	Oil Level Indicator With Contacts (Low & High)	Required (Magnetic Type)	Ok	A	Magnetic Type	A	Ok	A
8.6	Winding Temperature Indicator with Alarm & Trip Contacts	Required (Shall be Located Close to Low Voltage Windings)	Ok (LV Side Phase 2V)	A	Ok	A	Ok	A
8.7	Oil Drain / Sampling Device	Required	Ok	A	Ok	A	Ok	A
8.8	Air Dehydrating Breathed	Not Required	N.A	A	NA	A	Ok	A
8.9	Neutral Current Transformer	Core 1: 100/1A, 5P10 ,10VA	Ok	A	Ok	A	Ok	A
8.10	CT to be Supplied by (Transformer Manufacturer/Purchaser)	Transformer Manufacturer	Ok	A	PEJVAK	A	Ok	A
8.11	Earth Terminal	Two Terminals on The Bottom of Tank	Ok	A	Ok	A	Ok	A



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 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	EL	TB	0001		D01

TBE for 800 KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.12	Upper Filter Connection With Standard Seal Valve & a Plug Serving	Required	Ok	A	Ok	A	Ok	A
8.13	Pressure Relief Valve with Contact (Shall be Operated by Internal Pressure of Nitrogen)	Required	Ok	A	Ok	A	Pressure relief with trip contact for oil pressure	A
8.14	Gas Pressure & Vacuum Indicator for Internal Pressure of Nitrogen Gas	Required	Ok	A	Ok	A	Ok	A
8.15	Terminal Box With Gland Plate	Required	Ok	A	Ok	A	Ok	A
8.16	Instrument and CT Secondary Terminal Box	Required (Min IP55)	IP 55	A	Ok	A	Ok	A
8.17	Arching Horn	Not Required	N.A	A	Ok	A	Ok	A
8.18	Drain Valve	Required	Ok	A	Ok	A	Ok	A
8.19	Lifting and Pulling Eyes	Required	Ok	A	Ok	A	Ok	A
8.20	Lugs	Fixed to Tanks for Lifting the Complete Transformer	Ok	A	Ok	A	Ok	A
8.21	HV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	Ok	A	Ok	A
8.22	MV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	Ok	A	Ok	A
8.23	Wheels, Bidirectional (Turnable by 90°)	Required	Ok	A	Ok	A	Ok	A



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	BK	GCS	PEDCO	120	EL	TB	0001		D01

TBE for 800 KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.24	Transformer Radiator	By Vendor (Welded/Bolted)	Bolted	A	Ok	A	Bolted	A
8.25	Transformer Cover	To be Welded to Tank With a Continuous Weld	Bolted	A	Ok	A	Cover will be bolted	A
8.26	Thickness of Radiator Plate	By Vendor	1.2 mm	A	1.25 mm	A	1.2	A
8.27	Thickness of Tank Wall, Base & Cover	By Vendor	8, 8, 8 mm	A	8 mm	A	6, 6, 6	A
8.28	Tank Painting Specification	By Vendor	Acc to Irans Transfo Painting Procedure	A	Poly Uthane	A	RAL 7032	A
8.29	Radiator Painting Specification	By Vendor	Acc to Irans Transfo Painting Procedure	A	Poly Uthane	A	RAL 7032	A
8.30	Tank and Radiator Color	By Vendor	RAL 7023	A	7032	A	RAL 7032	A
8.31	Radiator Connection	Detachable & Shall be Bolted to Tank	Ok	A	Bolted	A	Ok	A
8.32	Rating Plate	Stainless Steel	Ok	A	Stainless Steel	A	Ok	A
8.33	Accessory Equipment Contacts Current / Voltage Rating	5A / 250VAC	Acc to Catalogue	A	5A / 250VAC	A	2A, 230Vac	A
8.34	Accessory Equipment Contacts Type	Dry Type –DPDT/ 230VAC	SPDT	N	Ok	A	Ok	A
8.35	Routine Tests Including	IEC 60076	Ok	A	IEC 60076	A	Ok	A
8.36	a) Measurement of Winding Resistance	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A



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	BK	GCS	PEDCO	120	EL	TB	0001		D01

TBE for <u>800</u> KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Arya Transfo	Status
8.37	b) Measurement of Voltage Ratio & Check of Voltage Vector Relationship	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A
8.38	c) Measurement of Impedance Voltage (Principal Tapping) Short-Circuit Impedance & Load Loss	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A
8.39	d) Measurement of No-Load Loss & Current	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A
8.40	e) Impedance & Load Losses at Rated Current on Principal Tap	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A
8.41	f) Applied Potential & Induced Potential Tests	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A
8.42	g) Dielectric tests	Witness & Report	Ok	A	Witness & Report	A	Acc. to contract	A
8.43	Type Test	Test Report on the Same Design Transformer is Required	Ok	A	Ok	A	Acc. to contract	A
8.44	Painting and Finish	MFR Standard	Ok	A	Ok	A	Ok	A
8.45	Test Report on CTs	- turns ratio error - Excitation Characteristics - Secondary resistance - Verification of low leakage flux	-	A	Ok	A	-	A
8.46	Special Tools if Any	By Vendor	-	A	NA	A	NA	A
8.47	Deviation from This Specification if Any	By Vendor	Attached	A	No Deviation	A	Red items	A

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	TBE FOR TRANSFORMERS								شماره صفحه: ۲۳ از ۲۴
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	EL	TB	0001	D01	

Status Legends:

A=Acceptable

N=Not Acceptable

N/A=Not Applicable

INA=Information Not Available

C=Clarification is Required

CA= Conditionally Acceptable

M = Requirement is Mandatory

Conclusion Table:

Item	Equipment	Vendor	Vendor	Vendor
		Iran Transfo	Kian Transfo	Arya Transfo
1	1250 KVA	Accepted	Accepted	Accepted
2	800 KVA	Accepted	Accepted	Accepted

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	TBE FOR TRANSFORMERS								شماره صفحه : ۲۴ از ۲۴
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	EL	TB	0001	D01	

Conclusion Note:

Iran Transfo

- 1- Item 4.2 of 1250 KVA Transformer: Vendor will not consider Lightning impulse withstand for LV Side.
- 2- According to item 7.7.3 of IPS-M-EL-152(3), the cover of the tank (item 8.25) for sealed type transformer shall be welded to the tank with a continuous weld. But vendor cannot meet this criteria & will supply bolted.
- 3- Item 8.38, Accessory Equipment Contacts shall be “Dry Type –DPDT/ 230VAC” but vendor will supply “SPDT”.

Kian Transfo

- 1- Dimension & weight of transformer differs from 2 other vendors & it is smaller.
- 2- No deviation list has been issued by vendor.

Arya Transfo

- 1- Item 4.2 of 1250 KVA Transformer: Vendor will not consider Lightning impulse withstand for LV Side.
- 2- According to item 7.9.1 of IPS-M-EL-152(3), Pressure relief device can be set to operate when internal pressure of nitrogen exceeds to 0.7 barg. But vendor will supply relief valve operation by oil.
- 3- According to item 7.7.3 of IPS-M-EL-152(3), the cover of the tank (item 8.25) for sealed type transformer shall be welded to the tank with a continuous weld. But vendor cannot meet this criteria & will supply bolted.